STATE OF UTAH
NATURAL RESOURCES & ENERGY
Oil, Gas & Mining

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Cleon B. Feight, Division Director

MEMORANDUM
* * * * * * * * * * *

TO: Board of Oil, Gas and Mining

FROM: Thomas L. Portle, Reclamation Soils Specialist TLP

SUBJECT: White River Shale Oil Corporation
White River Shale Project
ACT/047/017
Uintah County, Utah

DATE: July 22, 1982

The Division of Oil, Gas and Mining technical staff has reviewed the Mining and Reclamation Plan (MRP) submitted by White River Shale Oil Corporation (WRSOC). While many of the concerns identified by the staff have been adequately addressed, some remain. The applicant is currently pursuing these remaining items. The staff is of the opinion that the MRP will meet the requirements of the Utah Mined Land Relamation Act in the near future. The Division recommends the tentative approval of the MRP effective the date on which the staff can determine that the deficiencies have been fully remedied. At this time, the 30-day comment period would begin. Another matter which we wish to direct the Board's attention to is the applicant's bond proposal. This proposal involves an incremental bonding approach due to the delay between initial site development and the expansion to full acreage permitted under the Phase I permit.

The rationale behind this has to do with the WRSOC's lease stipulations with the BLM. There is a requirement to spend a substantial sum of money on site development by March 1, 1983. A delay in permit approval would make this more difficult to meet and could result in work being done at a less favorable time of year from both a construction and an environmentl standpoint.

An Executive Summary is attached for your review and information.

Attachment

TLP/btb

E X E C U T I V E S U M M A R Y

White River Shale Oil Corporation
White River Shale Project
ACT/047/017
Sections 10-12-14, 18, 19-30, 33 and 34
Township 10 South, Ranges 24 and 25 East
Uintah County, Utah

Background Information:

The White River Shale Project is a proposed oil shale development by the White River Shale Oil Corporation (WRSOC). WRSOC is owned by Phillips, Sohio and Sun Oil company's and are currently developing the Federal prototype leases Ua and Ub.

Pursuant to this, a Detailed Development Plan (DDP) was prepared in accordance with the Federal Oil Shale Lease. This plan is of a general nature with much of the final design to be approved at a later time when more detail becomes available. As such, it has been approved by the Oil Shale Office (OSO) following two public hearings.

It should be noted that the DDP has been reviewed by the Resource Development Coordinating Committee.

The Phase I Permit Application is intended to expand upon the DDP in terms of detail. It describes a full-scale demonstration project encompassing approximately 630 acres and involving extraction, processing and the surface disposal of processed shale waste. This will be followed by a commercial production facilities in Phases II and III.

Access to the resource will be via a decline shaft. Room and pillar methods will be employed to extract the resource contained in the Parachute Creek member Mahogany Bed of the Green River Formation (approximate thickness, 55-70 feet). Overburden depth varies from 600-1,200 feet.

Location:

The White River Shale Project is located approximately 40 miles southeast of Vernal, Utah, in Uintah County. The Federal prototype tracts Ua and Ub are leased through the BLM.

Surface facilities will occur on Sections 14, 22, 23 and 27, Township 10 South and Ranges 24 and 25 East. Please refer to the enclosed maps for the exact location.

Soils and Climatology:

Soils in the vicinity of the minesite occur between 4,900-5,900 feet in elevation. Nine different soils were identified in the minesite area. Soil textures vary from silts and sands along river to sandy loams and silty clay loams in upland areas. Soil reaction is mildly to strongly alkaline ranging from 7.5-8.9 in pH. Soils are derived from soft marine shale and sandstone of the Green River and Uintah formations.

An aridic climate prevails with rainfall ranging from six to nine inches with average soil temperatures being between 40 and 50^{o} F.

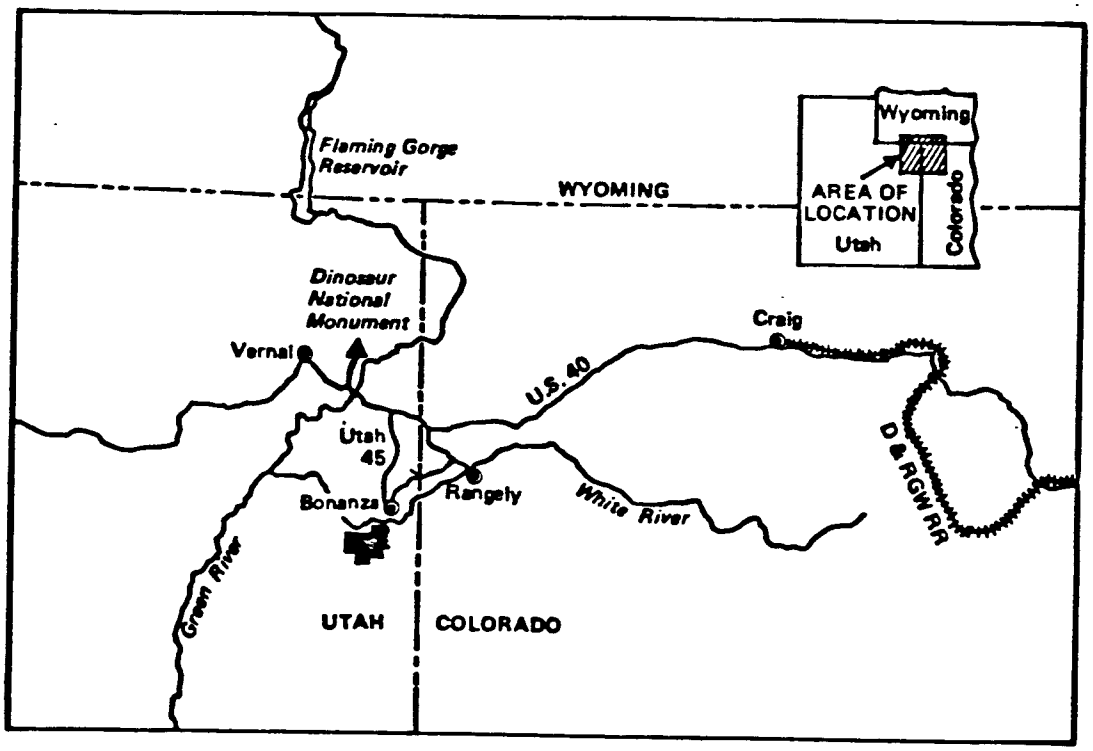
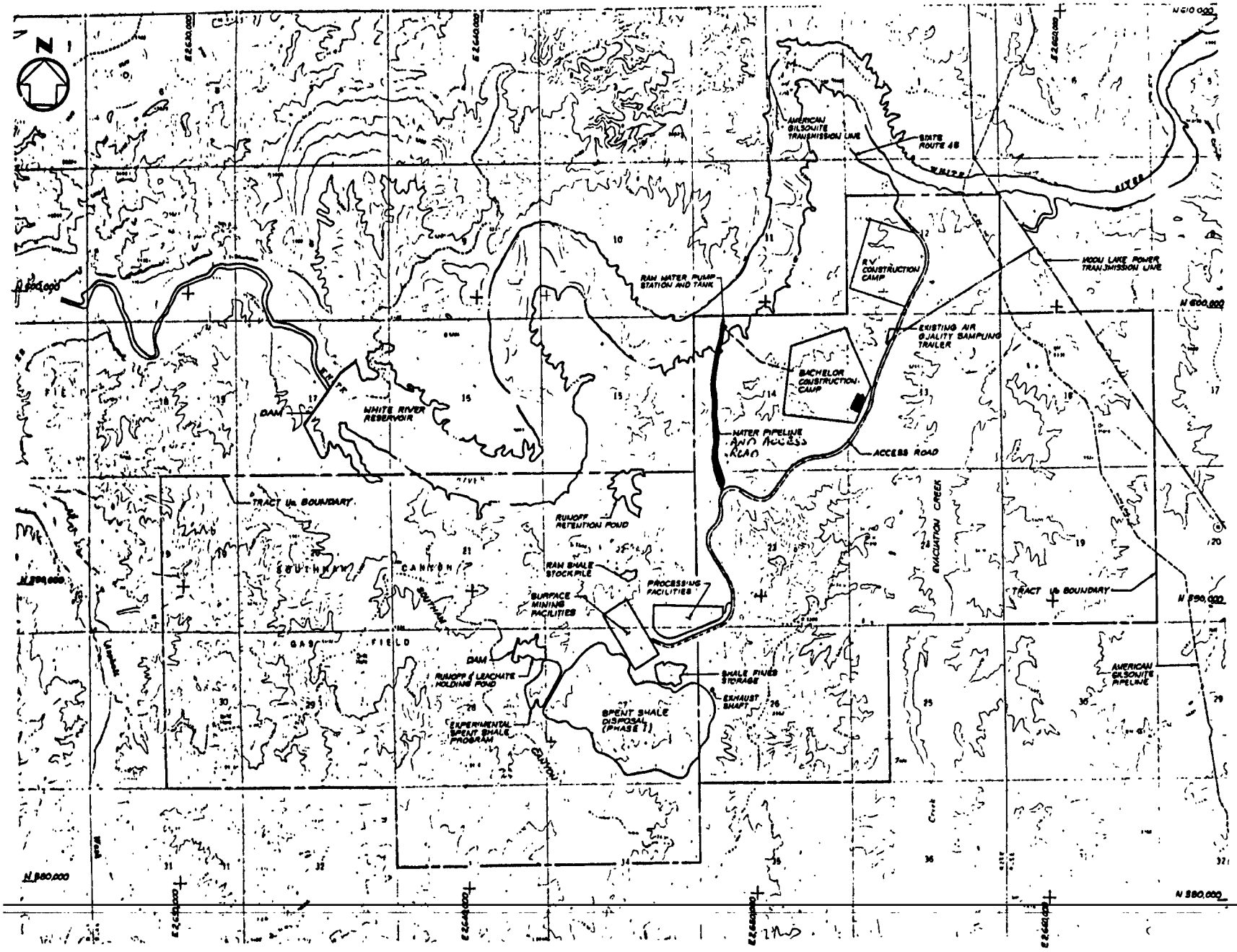


FIGURE 1-1 AREA MAP



LEGEND

- WATER PIPELINE
- UTILITIES CORRIDOR
- EXISTING CONTOUR
- LIMITS OF GRADING

EXHIBIT C

Geology:

Within Tracts Ua and Ub, the landscape is composed of a series of north and south trending valleys separated by narrow, elongated mesas. These are generally perpendicular to the direction of the White River.

The exposed rocks on the surface of the land are those of the Uinta Formation. These sandstones and siltstones were deposited by a meandering stream on top of the Green River Formation. In places, the Uintah Formation is 1,000 feet thick. The Green River Formation contains the rock oil shales of Utah. It was formed approximately 55 million years ago when an extensive intermontane lake basin made up most of what is now Utah. The various multicolored layers of this formation reflect the variable stages of evolution of the sediments in this lake basin. Basically, the high organic content of the Parachute Creek member is responsible for contributing to the commerical usefulness of the oil shale. This unit has a distinctively rich zone called the Mahogany Marker which is a sequence of especially rich oil shale rock. This is the target zone of the mining operation. It is predominantly a calcium carbonate mudstone, or marlstone containing abundant organic matter. There is a gentle dip (5^{o}) of the beds to the northwest and the thickness of the formation may be 1,600 feet on the Tracts.

A distinctive and often studied section of the Green River Formation is a zone known as the Birds Nest Aquifer. It contains many ellipsoidal cavities formed by the leaching out of narcolite, a soluble sodium-bicarbonate mineral from a matrix of siltstone and marlstone. It is the principal aquifer which will be encountered in the operation as it lies some 300 feet above the Mahogany Zone. Another interesting geologic feature of the area which will not be encountered in the mining, is the presence of gilsonite, a tar-like brittle residue of natural petroleum. It occurs in several long straight northwest- trending joints and minor faults primarily with the Uintah Formation. It may possibly be formed as a seepage product of the shale oil.

Ecology:

Four vegetation types have been identified in the project area; sagebrush-greasewood, shadscale, juniper and riparian. The juniper association, occurring on moderate slopes, consists primarily of Utah juniper in the overstory and galleta grass and Indian ricegrass in the understory. The sagebrush-greasewood community is dominated by big sage, greasewood and shadscale, with cheatgrass the dominant grass. Dominant shrubs of the shadscale community are shadscale and big sage. The riparian community along the White River is dominated by cottonwoods and salt cedar. Salt cedar and greasewood are the dominant shrubs in the riparian area along Evacuation Creek. Range conditions in the area are generally poor to very poor due to a history of sheep grazing abuse. No listed threatened or endangered plant species have been found on-site.

A list of all mammals, birds, reptiles and amphibians present was compiled and their distribution, density and abundance was determined. The majority of the species on Tract are seasonal users. The endangered peregrine falcon was seen on Tract twice, but it is not known whether it attempted to nest in the area.

Hydrology:

The project area is primarily drained by tributary ephemeral drainges to the White River which include Hells Hole Canyon, Southam Canyon and Asphalt Wash. Evacuation Creek just east of the facilities and spent shale disposal area is an intermittent drainage in that flow is sustained in the lower reaches throughout the year. A runoff retention pond will be completed within three years of initial project construction. All disturbed area runoff will be routed to this pond for solids settling. During the initial three year construction period, sand bag and earth berms and straw bale filters will be used to filter disturbed area runoff.

Ground water occurs through the region in alluvial deposits along major stream courses and throughout the Green River, Wasatch and Mesa Verde formations. The Birds Nest Aquifer of the Green River Formation is the only aquifer that will be intercepted during shaft excavation. The aquifer zone has many cavities which contain secondary calcite and are believed to have been formed by the leaching of nahcolite from marlstone.

Surface Facilities:

Surface facilities will be located on mostly Tract Ua and consist of a tract access road, construction camp, water pipeline, air quality sampling trailer, runoff holding pond, a waste water holding pond, a retention pond, ventilation and service shaft and production decline, warehouse, mine service building, change house, concrete bach plant, explosives storage, parking lot and various stockpiles for ore, waste and topsoil and eventually retort facilities.

Mining and Reclamation Plan:

During Operations:

1. Initially, 110 acres will be disturbed (initial bond proposal). During the Phase I permit, 635 acres will be disturbed.

2. All natural runoff occurring above the project will be diverted around the disturbed area. Approximately 850 acres are included in the total drainage area for the project.

3. The runoff retention pond will be sized for the 100-year, 24-hour precipitation event. A system of culverts, closed conduits and open ditches will be utilized to route flow to the pond. These structures are also sized for the 100-year, 24-hour event.

4. Runoff from the fueling and lubrication area (during construction) will be controlled separately in catchment basins in order to remove oil and other contaminants from the flow. Isolated fuel or oil spills will be removed immediately.

5. A leachate holding pond and dam will be constructed below the spent shale disposal area in Southam Canyon for solids settling of runoff from the shale.

6. An evaporation pond will be constructed immediately on-site to evaporate flows from the waste water treatment system.

7. Any ground water occurring from the Birds Nest Aquifer during shaft construction will be grouted off using grout curtains and dry walling. That flow which is encountered during mining will be used for dust suppression both underground and at the spent shale disposal area or pumped to the runoff retention pond.

8. Water supply will be obtained by trucking from the White River and extraction of alluvial ground water.

9. Detailed topsoil isopach maps used during soil removal will be an aid to the soils engineer to ensure that all available surface soils will be salvaged. Topsoil stockpiles will be seeded and/or otherwise stabilized to prevent soil loss.

10. All operational waste will be handled in accordance with permits granted by various Utah Department of Health agencies.

11. Ground and surface waters as well as subsidence will be monitored.

12. Mining and maintenance will be conducted in a safe and orderly manner.

After Operations:

1. All buildings will be disassembled, salvaged or otherwise removed from the site.

2. Building and road foundations and beds will be broken up and disposed of in shafts or buried at suitable depth.

3. The processed shale waste piles will be reclaimed using the methods being developed in current and future research efforts.

4. Shafts will be plugged to prevent safety hazards.

5. The mine areas will be regraded to allow for successful revegetation and attainment of postmining land-use.

6. Regraded areas will be topsoiled and seeded and monitored to ensure revegetation success.

7. All impoundments will be emptied or left as evaporation dams with the exception of the processed shale retention dam. All dams will be fenced and placarded. Rule M-10(3) requires that all dams and impoundments be left in a self-draining structurally stable manner. WROSC proposes to detail the reclamation of these structures in a report made at a later date to the OSO.

Variance Request:

M-10(3) As mentioned in 7 above, the applicant proposes to leave dams and impoundments on-site. A more detailed site abandonment plan will later be prepared for the OSO. At that time, it is proposed that the operator will request a variance to this regulation.

Surety:

The applicant proposes to obtain approval conditioned upon an incremental updating of the bond. A Board decision is sought regarding the feasibility of this approach. The initial bond calculations are included for your appraisal. This covers 110 acres (see attached construction schedule). Prior to further disturbance or on a given time interval (probably yearly) a bond update would be required.

A $1 million bond is currently held with the BLM to be released upon the concurrence of the OSO. The applicant desires that only one agency hold the bond. At this time, the Division is in the process of obtaining a sign-off provision on this bond. Also, a MOU with the OSO is being pursued.

PROPOSED WRSOC BOND FOR FIRST INCREMENT (110 Acres)
(as adjusted by Division)

	Cost
Electrical Systems	
Camps	$ 9,000
Mines	74,000
Major Equipment	75,000
Buildings/Earthworks	662,000
Revegetation	
Seed	92,400
Transplant	385,000
Seal Mine	80,000
Monitoring	10,000
1,000/year	
SUBTOTAL	$1,387,400
Administrative Cost @ 10%	138,740
TOTAL	$1,526,140

PHASE I MINE CONSTRUCTION SCHEDULE

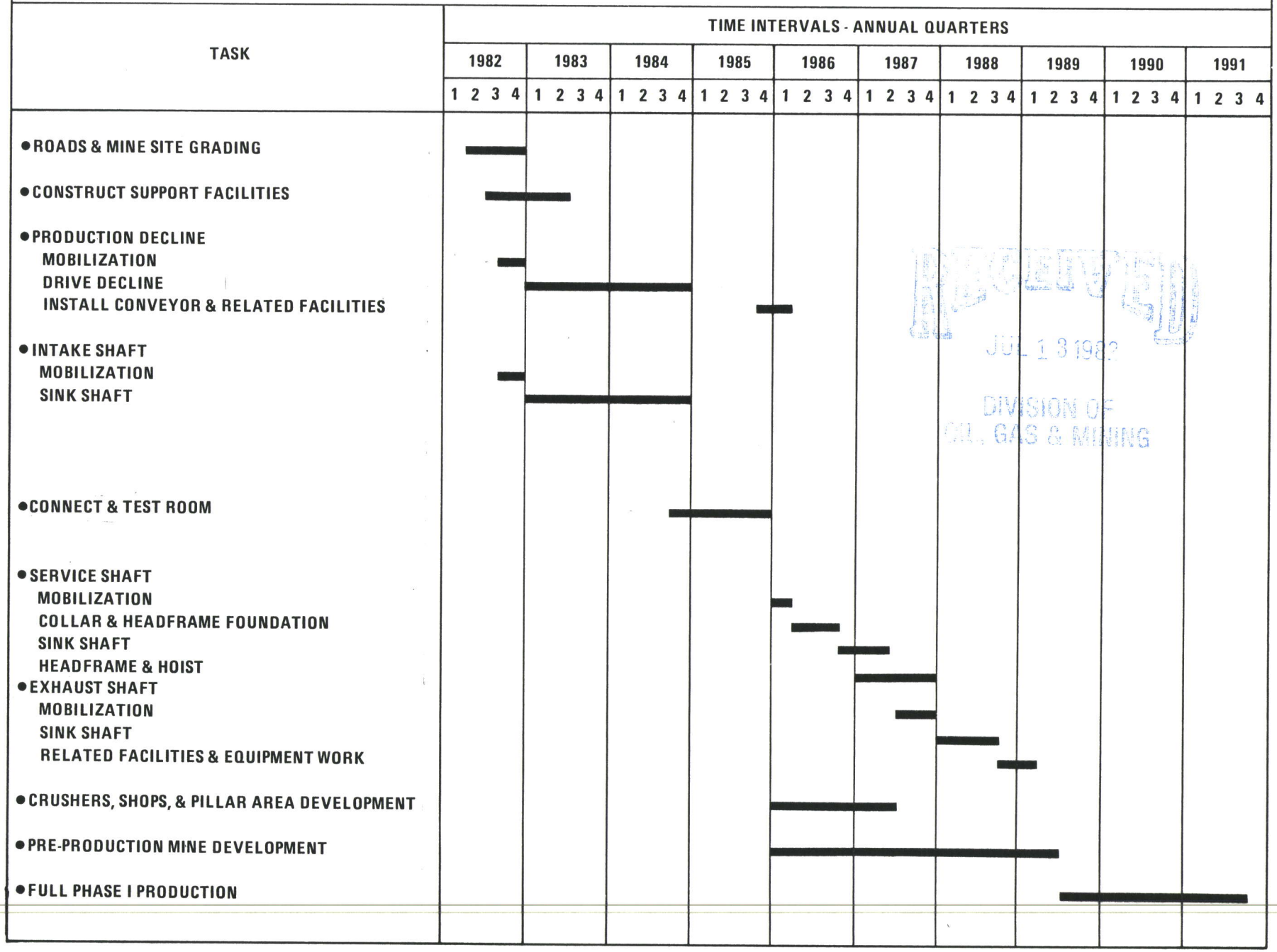


TABLE 1-1

APPLICATION HISTORY

June 15, 1976	Submitted copy of Detailed Development Plan (DDP).
August 24, 1981	WRSOC submitted "Progress Report on 1980 Environmental Problems."
April 1, 1982	Applicant met Division to discuss the development of the Phase I Mining Permit Application.
April 7, 1982	WRSOC provides written request to the Division to initiate limited site preparation.
May 4, 1982	Division recevied Phase I Mining Permit Application.
May 5, 1982	Division personnel inspected the proposed minesite.
May 24, 1982	Topsoil Management Plan was presented to Division pursuant to request for limited approval for initial site development.
June 8, 1982	Additional topsoil maps and information provided to Division.
June 28, 1982	Division receives a second written request to conduct limited site development work based on the "Topsoil Management Plan."
June 30, 1982	Division review letter forwarded to WRSOC.
July 8, 1982	Division grants approval to conduct limited site development.
July 9, 1982	WRSOC provides Division with written acceptance of stipulation attendant to July 8 approval.
July 13, 1982	Division receives WRSOC response to the review letter. Division representatives meet with WRSOC, BLM and OSO to identify and initiate procedures to resolve the bonding for Phase I.
July 16, 1982	Division meets with WRSOC to discuss deficiencies in WRSOC response to Division review letter.
July 19, 1982	Division forwards comments to WRSOC pursuant to resolving deficiencies.